

[54] CLEANING CONTACT LENSES WITH  
SOLUTION OF BROMELAIN AND  
CARBOXYPEPTIDASE[76] Inventors: Ronald L. Anderson; Maria R.  
Mascio, both of 525 Sunbury Rd.,  
Westerville, Ohio 43081

[21] Appl. No.: 346,013

[22] Filed: Feb. 5, 1982

## Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 232,392, Feb. 9, 1981,  
abandoned.[51] Int. Cl.<sup>3</sup> ..... B08B 3/08; C12N 9/48;  
C12N 9/50[52] U.S. Cl. .... 134/26; 134/42;  
252/174.12; 252/DIG. 12[58] Field of Search ..... 134/1, 42, 26;  
252/174.12, DIG. 12; 435/262, 264

## [56] References Cited

## U.S. PATENT DOCUMENTS

3,634,191	1/1972	Laboureur	435/264
3,720,402	3/1973	Cummins et al.	134/1 X
3,910,296	10/1975	Karageozian et al.	134/42 X
4,096,870	6/1978	Manfuso	134/42 X
4,285,738	8/1981	Ogata	252/174.12 X
4,323,467	4/1982	Fu	134/42 X

## FOREIGN PATENT DOCUMENTS

EPO5131 10/1979 European Pat. Off.

## OTHER PUBLICATIONS

Mihalyi, E., *Application of Proteolytic Enzymes to Protein  
Structure Studies*, (1978), pp. 43-93.Coorman, W. M. et al., "Bromelain, Biochemical and  
Pharmacological Properties," *Pharm. Acta. Helv.*, 51,  
Nr. 4, (1976), 73, 112.Spinell, M., *A Clinical Guide to Soft Contact Lenses*,  
(1979), pp. 3, 4, 13-15, 185, 186, 193-195.

Physician's Desk Reference, (1981), p. 1548.

Doi, E. et al., "Carboxypeptidase in Commercial  
Bromelain Power," *J. Biol. Chem.*, 1063, (1973).

Primary Examiner—Sidney Marantz

Attorney, Agent, or Firm—Porter, Wright Morris &  
Arthur

## [57] ABSTRACT

A method and composition for the effective cleaning and treatment of soft, high water content, contact lenses, particularly the non-aphakic lens approved for general extended use and the aphakic lenses approved for prescribed use as a method of visual correction for the aphake. The method comprises immersing the lens in an aqueous solution which includes the protease, bromelain, as a principal ingredient and a further minor portion of carboxypeptidase enzyme, as the cleansing and treatment agent. The combination of bromelain and carboxypeptidase enzymatic agents produces surprisingly better cleansing results, in substantially shorter time, than either agent alone. The solution removes protein, mucin, lipid, calcium, mineral, and other physiologically encountered debris from the lens; and the lens so treated shows enhanced resistance to the accumulation of further deposits when subsequently worn by the patient.

13 Claims, 6 Drawing Figures